WHAT IS CLAIMED IS:

1. An electron beam inspection system comprising:

an electron optics assembly;

a voltage contrast plate;

a multiplicity of secondary electron detectors situated between the electron optics assembly and the voltage contrast plate;

a wafer stage situated below the voltage contrast plate;

a multiplicity of image storage memory devices connected to the multiplicity of secondary electron detectors;

a multiplicity of image computers connected to the multiplicity of image storage devices;

a multiplicity of post-processors connected to the multiplicity of image computers; and

a display connected to the multiplicity of post-processors.

2. An electron beam inspection system as in claim 1 wherein the wafer stage has six degrees of freedom of movement.

3. An electron beam inspection system as in claim 1 further comprising a wafer situated on the wafer stage.

4. An electron beam inspection system as in claim 3 wherein the voltage contrast plate has openings which are beveled at an angle so as to produce an electric field free region at the wafer.

5. An electron beam inspection system as in claim 1 wherein the electron optics assembly comprises multiple electron beam columns.

6. An electron beam inspection system as in claim 5 wherein each electron beam column comprises:

an electron gun;

an accelerating region situated below the electron gun;

deflectors situated below the accelerating region;

a blanking aperture situated below the deflectors;

focus lenses situated below the blanking aperture; and

a field-free tube situated below the focus lenses.

7. An electron beam inspection system as in claim 1 wherein the electron optics assembly is comprised of electrostatic electron optical elements.

8. An electron beam column comprising:

an electron gun;

an accelerating region situated below the electron gun;

deflectors situated below the accelerating region;

a blanking aperture situated below the deflectors;

focus lenses situated below the blanking aperture;

a field-free tube situated below the focus lenses;

a voltage contrast plate situated below the field-free tube; and

a secondary electron detector situated between the field-free tube and the voltage contrast plate.

9. An electron beam column as in claim 8 wherein the electron gun comprises:

an array of field emission cathodes; and

an array of beam limiting apertures bonded to the array of field emission cathodes.

10. An electron beam column as in claim 9 wherein the array of field emission cathodes are individually operable.

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11. An electron beam column as in claim 8 wherein the accelerating region comprises:

an alignment deflector;

accelerator plates situated below the alignment deflector; and

a shield electrode situated below the accelerator plates.

12. An electron beam column as in claim 8 wherein the deflectors comprise:

a mainfield deflector; and

a subfield deflector situated below the mainfield deflector.

13. An electron beam column as in claim 8 wherein the voltage contrast plate has openings which are beveled at an angle so as to produce an electric field free region in the vicinity of the opening.